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ABSTRACTS FROM RUSSIAN PERIODICAL IZ. AK. NAUK, OT. TEKH. NAUK,

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1. "Approximate Formulae for Calculating Repeated Integrals", Corr-Mem USSR Acad Sci, L.A. Lyusternik and V. A. Ditkin, 5 pp.

"Iz Ak Nauk SSSR, Ot Tekh Nauk" No. 8 (Aug '48).

This paper demonstrates by several examples how to set up approximate formulas for calculating triple integrals of the form:

$$\iiint_Q f(x,y,z)\,dx\,dy\,dz = \sum_{i=1}^{n} M_i f(x_i, y_i, z_i).$$

The problem is to select points $A_1(x_1, y_1, z_1)$ and coefficients M_i such that the triple integral relation above is true for all polynomials of degree not higher than a number s. It is sufficient here that the above relation be exact for $f(x, y, z) = x^k y^l z^m$ where k, l, m are whole non-negative numbers and $k+l+m \leq s$; that is,

$$\iiint x^k y^l z^m\,dx\,dy\,dz = \sum_{i=1}^{n} M_i x_i^k y_i^l z_i^m$$

The method is to set $f(x, y, z) = \exp(xD_1 + yD_2 + zD_3)$, where the D's may be any value, and to set $f(x+\xi, y+\eta, z+\zeta) = \exp(xD_1 + yD_2 + zD_3) \cdot f(\xi, \eta, \zeta)$, where the D's are now operators. An example given is $\iiint_V 1 z / \sqrt{x^2+y^2+z^2}\,dx\,dy\,dz = 1.26$ (where V is a hemisphere).

Submitted 17 May 1948 by Acad. N. G. Bruyevich.

2. "Optimum Binomial Tabulation of Functions", L. Ya. Neyshuler, 22 pp.

"Iz Ak Nauk SSSR, Ot Tekh Nauk", No. 8 (Aug '48),

This paper introduces several new concepts and designations. If the function $f(x_1, x_2, \ldots, x_n)$ can be represented as a superposition of k functions $f_1, f_2, \ldots, f_k$, each of any two variables, then the set of k tables, each with two "entries", for these k functions will be called the k-term tables of this function.

Submitted 12 May 1948.

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3. "Several New Methods for Calculating Sums of Products on a Tabulator", I. Ya. Akushskiy, 35 pp.

"Iz Ak Nauk SSSR, OTN", No. 8 (Aug '48).

The calculation of sums of products is very important because it is involved in: numerical integration, differentiation; interpolation of tables; practical harmonic analysis; numerical solution of problems of linear algebra (multiplication of matrices, vectors; solution of systems of linear algebraic equations; representation of a vector operator in the form of a polynomial); etc.

This paper discusses the binary representations of multipliers. Only the main content of binary methods will be presented; their application to the solution of the above problems will be discussed in special publications.

Any number N can be given in the binary representation thus:

$$N = E_0 + E_1 \cdot 2 + E_2 \cdot 2^2 + \cdots + Eq2^q + \cdots + E_n \cdot 2^n.$$

The present paper takes up the matter of directing, to certain counters s of the tabulator, numbers in the representation by means of selectors S. A very intricate symbolic notiation is worked out.

Submitted 24 May 1948 by Acad. N. G. Bruyevich.

4. "The Accuracy of Electrical Calculating-Solving Circuits", M. L. Bykhovskiy, 37 pp.

"Iz Ak Nauk SSSR, Otdel Tekh Nauk" No. 8 (Aug '48).

This paper considers errors that arise in the R, C, L, M circuits. The mathamatical expressions connecting these quantities and current are examined for various incremental changes in R, C, L, M (representing "erors"), and

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continued

for various circuit schemes. Circuits with nonlinear resistances are studied, also the probability analysis of errors.

Submitted 17 May 1948 by Acad. N. G. Bruyevich.

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5. "The Electronic Calculating-Analytical Machine (ENIAK)", M. L. Bykhovskiy, "Iz Ak Nauk SSSR, of Tekh Nauk", No. 8 (Aug '48).

A survey of five English-language articles on the ENIAC: Hartree's "The ENIAC: An Electric Computing Machine", Nature 158, Nov 4015, 12 Oct 1946; etc.

Submitted by Acad. Bruyevich.

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Note: The above 5 abstracts represent those not done previously, in Izvestiya Ak. Nauk SSSR, Otdel Tekh Nauk No. 8 (Aug '48). The other abstracts done earlier have appeared in Per Abs 12T/48 ~~and number 8~~.

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